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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

Editorial Notes

and EXPRESSIONS

A few words can epitomize the Southern Great Plains, complex as it is—wheat, oil, grass; wind, dust, drought; prairies, dunes, mesas; distance, sunshine, heat, and, in these later days, dust storms, migrants, diversification, rehabilitation.

This issue of *LAND POLICY REVIEW* is devoted entirely to those words and the conditions and problems they connote. No attempt was made to make the picture of the Southern Great Plains complete. There are not enough pages for that. But it so happens that this collection of articles considers in one way or another all the major problems of the area.

The contributors: Edwin R. Henson is the Coordinator for the Southern Great Plains. Lionel C. Holm directs the FSA rural rehabilitation program in Colorado, Kansas, and Oklahoma. Fred J. Sykes is chief of the division of agronomy and range conservation of the Southern Great Plains region, Soil Conservation Service. Earl H. Bell recently became leader of the division of farm population and rural welfare, BAE, in Amarillo, Texas. He has made a special study of Haskell County, Kansas.

H. H. Finnell is Conservator for the Southern Great Plains region. Glenn Grisham is the manager of the El Pueblo project. Norman G. Fuller manages a land use project at Springfield, Colorado. Lewis T. Nordyke is a staff writer on the Amarillo Globe-News. He contributes frequently to magazines and is recognized as an authority on Southern Great Plains history. Elsie Marcle is Mr. Henson's secretary.

P. V. Cardon is assistant chief of the Bureau of Plant Industry. W. G. McGinnies is an ecologist at the Southwestern Forest and Range Experiment Station, Tucson, Arizona. O. S. Aamodt is principal agronomist in charge, division of forage crops and diseases, Bureau of Plant Industry. Sydney H. Watson heads the revegetation program of SCS at Amarillo, Texas.

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Borrowed Time in THE DUST BOWL

By EDWIN R. HENSON. *The Coordinator for the Southern Great Plains outlines the drought-made problems of his region and the attempts to solve them. He cites reasons for optimism and, most important of all, he points out the paramount lesson of the drought years: We must not forget.*



The Dust Bowl, they say, is coming back: The intense, heart-breaking dust storms are less severe; revegetation is progressing, and grass once more is getting a hold on the loose soil; farmers have more money and more hope and more knowledge that they cannot survive by wheat alone.

Yes, the Dust Bowl is coming back, but the fact alone means little. It will take years for complete recovery. Nature needed centuries to clothe the soil. In a few crop seasons man destroyed that cover by plowing. And now years more are required, even with the best help of agronomy, botany, and ecology, to bring the denuded acres to their best permanent use. Furthermore, it is largely public money that has sustained the owners and operators in their

travail, and it is Government-sponsored projects that have led the way to progress. We cannot say that the Dust Bowl has regained completely its economic health until its own people can stand alone and work alone.

And the Dust Bowl will not have recuperated until we can say, with assurance and certainty, that we have learned the lesson of the great plow-up, that we understand the uses and limitations of this fertile but dry empire in parts of five States, and that we will not forget.

We must not forget that there will be temptations again in the cycles of humid years to plow it up once more for grain; that diversification is important here, as elsewhere; that man cannot fight nature in this area of marginal values; that "man strides over the land, and deserts follow in his footsteps."

Our first mistake was made under homestead laws, by which Great Plains land was parceled into units too small to sustain families: A second mistake was to break down grazing units into grain farms, so that soil was left prey to wind and, through drought, to blowing. Both developments were checked only by the exodus of farmers, driven out by tractors and increasingly severe dust storms and drought in the 1930's.

What we have done can be called a major accomplishment. I review it here to indicate the enormity of the task engendered by a few years of thoughtlessness and to emphasize that what we have done is not enough—that we must make sure that we will not forget.

Many counties lost more than half their farm population. The acres abandoned by these refugees from dust immediately became a major problem. Untended, unstirred, and drought-denuded land blew across neighboring farms and covered crops, wind-checking devices, roads, and homes. Good farms under good management were leveled into barren wastes by drifting sand.

So acute was the situation that the first Southern Plains (or Dust Bowl) Committee was created to study the situation and to recommend action to relieve the growing destitution and despair and to take immediate steps to make usable a portion of the blowing soils and the occupied homes.

Listing, and the First Emergency Program

The immediate need was for a mechanical device to check temporarily the blowing of the soil; the simple remedy was to plow the

ground crossways of the prevailing wind. The Committee then started an emergency program; Congress authorized the use of \$2,000,000 in the parts of Texas, Kansas, Colorado, New Mexico, and Oklahoma that came to be known as the Dust Bowl. Farmers were paid for listing their own lands and nearby abandoned lands.

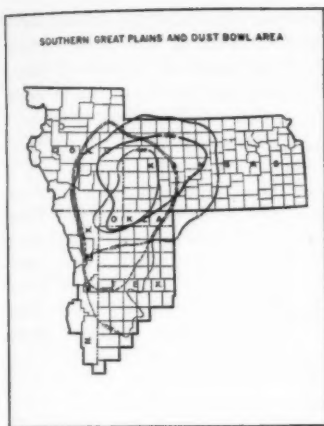
In some places so much land had been abandoned that it could not all be covered with vegetation, and severe dust storms were still occurring.

From that beginning, farmers generally recognized the desirability of having all uncovered lands listed to check wind erosion. The emergency funds for this purpose have been exhausted, but listing has been encouraged through other programs. Now, neighbors expect farmers to list exposed blow-land.

Another lesson was that a growing crop of sorghum, broomcorn or even weeds can be valuable as a natural cover.

Considerable progress has been made throughout the area in controlling wind erosion. Technicians have standardized land treatments that minimize the likelihood of severe dust storms; the Agricultural Adjustment Administration has progressed continuously until eligibility for AAA payments now requires the control of wind erosion and practically all the practices paid for contribute toward the checking of erosion.

Requirements for Farm Security Administration loans likewise include provisions for controlling wind erosion, for carrying out conservation measures, and for having proper moisture relations before seeding a crop. The Soil Conservation Service



has developed plans for contour furrowing on pastures, contour planting of crops, and a system of small terraces close together so that the water must go into the ground uniformly over a field.

Experiment stations and SCS technicians have experimented with the revegetation of lands that were plowed but that should have remained in grass. The AAA designated a special classification of restoration land to encourage the planting of grass. This problem of revegetating lands once plowed ill-advisedly for wheat has challenged the ingenuity of all our research people, but only partial solutions have been found. The difficulty of putting land to its proper use by revegetation, plus the problem of handling abandoned and tax-delinquent land, magnifies the importance of land management in this area.

Half the land in most of the counties is tax delinquent. Most of such land belongs to residents; absentee owners normally keep their taxes

paid. Schools were disrupted when people left the land; roads, too extensive for the present population, need reorganization. Counties without taxable oil, railroad or similar property meet their budgets with extreme difficulty.

Under these circumstances farmers and agricultural workers hope to reestablish a permanent agriculture through sound planning and the co-operation of all agencies.

People living in this area are beginning to realize that even though they have made what seem severe and radical adjustments they must make even more radical adjustments to solve the pressing problems still confronting them.

The Place of Federal Help

Leading farmers as well as most departmental and State workers know that farmers here have been dependent upon the Federal Government. Through the years of drought the money these farmers had to spend came from their wheat allotments. Almost always these AAA payments were supplemented by Farm Security loans or grants, feed and seed loans, and considerable direct relief.

With the establishment of these several means of Federal help, people in communities here and there began to think and plan seriously for the future at home—not somewhere else. At first many were content to let things rock along holding on by their finger tips through the assistance given by the agricultural program, and praying for a good crop year. But even then many were convinced that some basic adjustments in land use would have to be made before there could be a stable agriculture in this area.

This realization among the people was the most hopeful sign then, and is the most hopeful sign for the future.

In Sherman County, Tex., for example, absentee ownership and even absentee farming were prevalent. Resident tenant- and owner-operators found their efforts to control wind erosion on their own lands less and less effective as adjacent lands were abandoned and not controlled. This group proposed to the Agricultural Adjustment Administration that the AAA program be operated on a new basis in Sherman County.

They asked that the wheat allotment money that would come to the county for the individual farms be pooled and that individual farmers be required to earn any AAA payment they received by carrying out wind-erosion control practices on their lands. These included listing, leaving cover on the land, strip cropping, planting borders of sorghums around the field, and similar operations that tended to check the destruction of crops by blowing sand and thus make the community more habitable. They received the right to try this method, and the proposal was adopted by practically unanimous farmer vote. After the first year, the plan was so effective in controlling wind erosion that the county voted 100 percent to continue it.

In Greeley County, Colo., farmers were almost desperate and afraid that they would have to abandon their homes. There seemed little chance that the general programs in that county would improve conditions so that the operation of farms would become profitable again.

They got together and decided that concerted action was needed and

that all farmers must control their land in order to save their homes. They adopted the practice of strip-cropping sorghums or sudan grass and voted on themselves a requirement that every field on every farm must be alternately stripped with a row crop that would check the wind and stop the blowing of sand. They still could grow some wheat between the strips. Farmers were encouraged to bring under this program abandoned lands adjoining theirs. This strip-cropping made Greeley County a real picture during the growing season and was largely successful in preventing wind erosion.

Since the inception of the first experimental program in Sherman County, similar programs are in force in 7 Texas counties. The Greeley County plan was followed in 10 Kansas counties last year. It is thought that 54 counties in all will be following a true conservation program for 1941. With slight modifications, the programs have been blended into a type under which AAA pays farmers for carrying out conservation work and reduces their wheat acreage but not the amount of their payment.

Departmental and State workers and leading farmers now contemplate the gradual expansion of such programs to cover the entire Dust Bowl and perhaps other areas. In each of these counties, wind erosion control is militantly demanded of the farmers by their neighbors, so that in many places when a man's farm starts to blow and he does not immediately begin listing, local land use planning committees call upon him and request that he list his land.

In other sections farmers have banded together into a soil conserva-

tion district and within this district are bending every effort to control wind erosion and to reorganize farms and the land management program in such a way that schools, roads, and farm units are adjusted to the needs of the people.

In a single year one soil conservation district has leased as much as 39,000 acres of land in order to bring it into compliance with the AAA program and to control wind erosion.

In another area county commissioners, finding themselves short of tax income, with approximately 250,000 acres of their county land tax delinquent for more than 5 years, began to study means of correcting this condition. The land is being used, even though it is tax delinquent, usually by cattlemen who allow their stock to trespass without paying rent or tax.

Such a large amount of land was tax delinquent that the Farm Security Administration was finding it difficult to locate suitable units on which to establish farm families with a reasonable assurance that they could repay their loans. After studying this problem, FSA and county commissioners worked out an agreement, whereby FSA would block up enough of these tax delinquent lands to make a minimum unit of suitable size for efficient operation. The FSA would agree to finance the farmer who needed to be relocated and equip him for operating this unit if, in return, the county commissioners would agree to take title to the tax delinquent land and then sublease it to the borrower for at least 10 years. The commissioners likewise agreed that the rent on this land should be determined by a range survey and that they receive compensation in ac-

cordance with the actual use value of the land.

The farm units set up under this cooperative plan are the same as the reorganized units set up in the soil conservation district. It is believed they offer a permanent, long-time solution of problems of proper land use in this area.

Public Programs and Borrowed Time

The effectiveness of these programs is apparent to those acquainted with the Dust Bowl before and after it became a problem area.

But until we are out of the emergency stage we are living and working on borrowed time in the Dust Bowl.

An historical perspective that recognizes the best uses of the land—in the light of Nature's way, the emergency way, and the soil technician's way—is part of the permanent solution.

Another part is the development of a public opinion and sound knowledge of marginal problems so strong and so wide that they are proof against temptations, public or private, to plow up again the marginal lands in times of normal rainfall or under duress of greater grain production or when nonagriculturalists of this or that county believe that greater prosperity will come in plowing up marginal land than in following the patterns made by nature or formulated by careful, sound agronomists.

In other words, we must insure ourselves against too great optimism that would push us this way or that, against our more sober judgment and that of the men who have studied the Dust Bowl and know its uses and limitations.

What Is Happening To "FARMS TAILORED TO FIT"

By LIONEL C. HOLM. In *Land Policy Review* for May-June, 1939, Roy I. Kimmel told about efforts to help farmers in the Southern Great Plains by reorganizing their holdings and methods. This progress report tells about loans to 400 farmers, their financial condition, increased stability through diversification, and outstanding problems of taxes and leases.



Unit reorganization is an attempt to promote sound land use and establish a stable agricultural economy by assisting the individual operator to shift from a cash crop system of farming to a diversified livestock and feed crop system.

The Farm Security Administration advances the necessary funds to establish a unit, to cover operating expenses, and to purchase a foundation herd of breeding livestock on a repayment period up to 10 years. The Soil Conservation Service furnishes technical assistance in preparing a plan of conservation operations on the unit which is designed to stabilize the blow land, put into practice conservation operations, and promote good range management. The supervision and servicing of the loan are the responsibility of the FSA.

Since the inauguration of the program early in 1938 until June 30, 1940, approximately 400 loans of this nature have been made in Colorado, New Mexico, Texas, Oklahoma, and Kansas; more than 250 of them in 14 southeast Colorado counties. A survey of 71 representative units as

of December 31, 1939, was made to get a fair indication of the operators' progress under this type of organization. Some of the units had been in operation for 2 years and some for only 1 year, but no case was considered that had not been in a position to produce at least one calf or lamb crop.

The consideration of any program in terms of averages is not a true index of an individual's progress; nevertheless, in this instance it is probably the best way to determine what has been accomplished. The average individual as here considered represents the average of the results obtained in the survey.

This average individual, before receiving a Unit Reorganization loan, was farming approximately 1,200 acres, with some 820 acres in grass and about 380 acres in cultivation. His reorganized unit consists of 2,050 acres, with 1,620 acres in grass and 430 acres in cultivation. Previously, he had 13 head of cattle, of which only 8 were cows or 2-year-old heifers.

Upon receiving his loan, he purchased additional cattle, so that he

had 19 head of producing cows and heifers. By January 1, 1940, his herd had increased to 40, of which 26 head were cows and 2-year-old heifers; the rest were steer calves, heifer calves, and yearling heifers being retained to increase the breeding herd.

Increasing Net Worth

The net worth of this average client when he obtained the loan was \$428. He owed the FSA \$687; he owed other creditors \$1,507. As of January 1, 1940, his indebtedness to the Farm Security Administration, (including supplemental loans after his initial loan, less repayments he had made during that period) was \$1,771. The other obligations had been decreased to \$1,114. A comparison of his total obligations at the time he obtained his Unit Reorganization loan and as of January 1, 1940, shows that they have been increased from \$2,195 to \$2,886, an increase of \$691. During that period his net worth increased from \$428 to \$1,134, a gain of \$706. During the time that he has operated under the Unit Reorganization plan, he has received \$336 in supplemental loans and has repaid \$560, but it has been necessary to provide him with \$90 worth of grants.

Financially, this typical client has not made startling progress, because his increase in net worth is offset by an almost equal increase in indebtedness, and the amount of his repayment is only \$134 more than the amount it has been necessary to advance in the form of supplemental loans and subsistence grants.

He has been able, however, to retire debts of \$393 to outside creditors.

This is about what was anticipated, as the first repayments were expected to be low so that the borrower could build up the carrying capacity of his range, increase his cow herd, and stabilize the land that was to be restored to grass.

A further analysis should be made to determine whether this average client's earning capacity has been increased and whether from now on he can better himself financially.

It has been noted that the productive units in his herd have increased from 19 to 26. The carrying capacity of his range has increased from 149 to 184. He has 23 tons of stacked feed on hand as of January 1, 1940, besides 412 acres of grass reserve that has not been pastured during the growing season. His farm program has been altered so that instead of devoting 69 acres to feed crop he is now devoting 112 acres. The amount of supplemental pasture has been increased from 5 acres to 20, and the acreage of hay, both tame and native, increased from 6 to 15; 172 acres of restoration land are included in this program of which 140 acres already have been stabilized.

He has contour-furrowed 170 acres of pasture and he contemplates contouring considerable acreage over a period of years. The total cost of his leased land for 1939 was \$180. The grazing cost was \$3.40 per cow. With increased carrying capacity and a growing herd this cost per head will be lowered over the next few years. In 1938 he had a calf crop of 82.5 percent which was increased in 1939 to 84.7 percent. With younger cows and better bulls, together with improved range and sufficient supplemental feed, he should be able to increase further this percentage.

All these factors point to a brighter future with increased earning capacity. This is borne out by the fact that his actual income for the year in which he received his loan was \$900, while for the year ending January 1, 1940, he had an income of \$1,667.

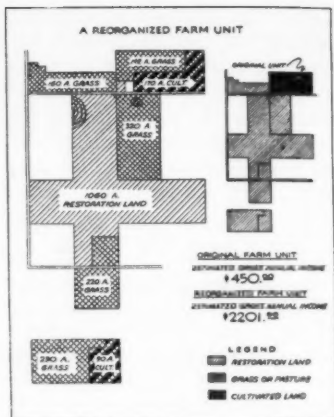
Several other facts, brought out in the survey, can be presented better on a basis of total, rather than average, figures.

The total amount of repayments from these 71 cases has been \$39,769, including \$30,623 from the sale of livestock, \$7,063 from Agricultural Conservation Program payments, and the balance from a number of sources. The total repayment from crops in these 71 cases is only \$664—quite indicative of the reorganization accomplished in shifting from a cash crop economy to a livestock and feed program.

In all, 12,255 acres of land have been placed under the Restoration Program; 11,988 acres have been contour-furrowed; 110 stock ponds constructed, and 141 wells developed for stock water. If these 71 cases are representative of the 400 loans, one could assume that 68,800 acres have been placed under the Restoration Program, of which 56,000 have already been stabilized and the first step taken toward the reestablishment of the grass cover.

The AAA Program

The total AAA payments collected by the 71 borrowers in 1939 amounted to \$19,834; \$7,000 of this was applied on FSA loans and the remainder went into operating expenses. The Agricultural Adjustment Administration should be given considerable credit for the progress of these units. The earn-



ing capacity of the units during the first few years is necessarily low, and the AAA payments are essential in tiding them over this crucial period.

On the other hand, it may be pointed out that in some areas the AAA program has tended to retard the expansion of the Unit Reorganization program. This results from the emphasis placed by the AAA program on special crops, such as wheat. It is hoped that the new special program sponsored by the AAA and adopted by several counties in Texas and Kansas during the past year, whereby any special emphasis on specific crops is removed and the entire emphasis of the program placed on conservation practices, will meet with public favor and be adopted over a much wider area. This type of AAA program will aid in the expansion of the Unit Reorganization program.

The development of the Unit Reorganization program has been relatively slow. There are several reasons for this.

It has been interesting to note the attitude of the land owners and operators in attempting to develop this program. Many land owners in this area are nonresident and have very little knowledge of the actual condition of their own holdings. In some instances, it has been found that the owner had the impression that he owned a tract of grass land, while actually his land had been broken and farmed to wheat some years ago and had become a blow hazard.

Few of these absentee owners had been getting any income from this land for a number of years. It would seem that, having received no income for years, they would have everything to gain and nothing to lose by entering into a long-term lease contract that would give a definite cash return. This has not been the case. The average owner seems to believe that some day his investment will develop into the bonanza for which he had hoped when he made it. Therefore, on first contact, he has been reluctant to enter into a long-term lease in line with the actual earning capacity of the land.

In most cases where personal contact could be made with the landlord or adequate explanation made through correspondence of the aims

of the program, of conservation practices that would be put into operation, and the supervision that would be given the operations of the borrower by the Farm Security Administration, satisfactory leases have been obtained. This, however, is a slow process, as the rounding out of a unit usually necessitates the leasing of land from 8 to 10 owners.

Security of Tenure

The attitude of borrowers also has varied. Many of them could readily see the advantages of operating under a lease, but there were others who could not. They had the opinion that if they could obtain security of tenure on a small tract of land to use as an operating base, they did not need to spend cash for leases on the surrounding land. In some instances, they had been using some of this land for grazing for several years without any cash cost, and therefore saw no reason why they could not continue to do this if the Farm Security Administration would merely lend them enough money to expand their operations.

It was evident that the future success of the Unit Reorganization program depended upon equitable tenure arrangements for both the tenant and the land owner. Conservation practices and good range management could not be fostered by any arrangement which would not fix upon the individual operator the responsibility for obtaining maximum results from a given tract over a 10-year period. It was felt necessary definitely to block out the unit through leases in order to prevent encroachment by other operators and overgrazing by itinerant herds of cattle and sheep which drift from area to area where local grazing condi-

Policies

Policies in a democracy should grow out of the soil of intelligent and informed public opinion. —M. L. WILSON

tions are good and unfenced land is available. The land owner also had to be assured of a fair return from his land if he was expected to be a partner to a permanent organization.

Taxes have been a vital factor in developing these units. If the carrying capacity of the unit as a whole permits the operator to pay a cash lease equal to or greater than the taxes on the land, a lease can usually be obtained. In many areas, however, the tax assessment exceeds the earning capacity of the land, and difficulty is immediately experienced in attempting to lease such lands, although the owner may not have had any return from this land for many years.

A discrepancy in taxes is particularly obvious between Colorado and Kansas. Grazing land of like carrying capacity will have a tax assessment in Colorado of from 4 to 10 cents an acre, while similar land across the line in Kansas will vary from 8 to 15 cents an acre. The tax structure has a profound bearing on the reorganization of an agricultural economy.

Inability to graze taxes out of the land contributed to the breaking of large areas of land unsuitable for cultivation. Without an adjustment in taxes, it will be difficult to justify the retirement of these same lands from cultivation. The land owner will elect to keep it in cultivation in the vain hope that sufficient income will be realized from crops to enable him to meet his overhead charges.

Considerable work has been done in Colorado to readjust the tax base in line with the earning capacity of land, and still more needs to be done.

This problem is now being considered by State and county land use

planning committees in Kansas, and it is hoped that something constructive will come out of their considerations of this problem, which will assist in the establishment of a stable agricultural economy in portions of western Kansas.

The nature of the Unit Reorganization program is such that security of tenure is absolutely essential. At the outset, it was believed that this security could be gained only through leases on the essential parts of the operating unit for at least 10 years. It soon became apparent that few land owners were willing to sign a lease for such a period. Requirements were relaxed so that units were set up with 5-year leases, and on portions of the holdings that were not considered absolutely essential leases were accepted for 3 years.

Many owners apparently were holding their land not as a permanent investment but were wanting to sell it whenever they would be able to get their money out of it. Therefore they insisted on having a subject-to-sale clause in the lease. Such clauses are dangerous to the future of the Unit Reorganization set-ups.

The number of cases where units have been wrecked by this provision to date is not large; the alarming aspect is that not only private owners but governmental agencies, too, with holdings in this area, appear eager and willing to use the sales clause in their leases.

Portions of units have been sold without much apparent consideration for either the effect upon the individual unit or the long-time use of the land. In several instances a client has leased tracts of land that were in a bad blow condition. With considerable effort and expense the

client succeeded in fencing and in stabilizing this land, only to have the owner sell the tract, even though it may have been an essential part of the unit.

The Federal land bank has never agreed to give more than a 5-year lease, subject to sale, on any of its holdings. The bank has sold several tracts and thereby wrecked a well-organized unit for an operator who could make sound use of this land.

It is doubtful whether much of this land has been sold in such a manner that it will stay sold. Certainly it is not fair to the individual operator to be deprived of the use of this land just when he is in position to reap some of the benefits of his labor in restoring the land to a salable condition. Considerable educational

work needs to be done with private land owners in this connection, and closer coordination of land use policies between various governmental agencies is definitely needed.

It is realized that during the relatively short time in which the Unit Reorganization program has been in operation comparatively high livestock prices have prevailed. The true test of whether or not this program will provide a stable agricultural economy for the Southern Great Plains will come when it faces both drought and low livestock prices. Considering the feed reserves being built up and the flexibility of repayments permissible under the financing arrangements, it seems reasonable to hope that the Unit Reorganization program can successfully hurdle both these hazards.

The land may bloom again if man once more makes his peace with Nature. Careful planting will give him back the foothill trees; terracing will save lush foothill farms; a wise use of the land will restore grass for controlled grazing; fewer and larger farms on scientifically selected sites may yield under the plough a comfortable living; dams will hold back the waters from rains and melting snow, giving power and controlling the flow of the life-giving streams; springs may be developed, water pumped by windmills to water cattle, moisture held in the soil by scientific methods of tillage; by such means the life of man on the land may be made happier, more prosperous, more secure. The sun, the wind, the rain, the snow can be friends of man, not enemies. This is no Utopian dream. It is a promise, to be realized if we will.

—THE FUTURE OF THE GREAT PLAINS

How to Tie DOWN A SAND DUNE

By FRED J. SYKES. *Out at Caddoa, Colo., Army engineers are starting to build a \$14,000,000 dam and reservoir, 14 miles long, to irrigate a large area in western Kansas and eastern Colorado, to control floods, and to regulate run-off of the Arkansas River. The project was conceived two decades ago and involves many interesting points, one of the most striking of which is here discussed—the stabilization, in a hurry, of troublesome dunes.*



A primary lesson in soil stabilization, on a basis resembling a laboratory experiment, is being given in eastern Colorado, where farmers used to look up the Arkansas River for flash floods to water their crops and where now they look to the John Martin dam and reservoir project as insurance against drought and crop uncertainties.

The problem was this: Several miles of the Santa Fe Railroad's main line within the reservoir area had to be moved before the dam could be started. One possibility was to relocate the tracks through a valuable irrigated section of the valley, across the river. That would mean the building of drainage structures and two bridges, besides outlays for expensive land.

The other possibility—the one that finally was chosen—was a 20-mile-long right-of-way south of the original location and through structureless, sandy, dry grazing land, where active sand dunes range in size from one-half acre to 100 acres

and from 5 to 20 feet in height. The estimated saving of this route over the other is \$2,500,000.

The Corps of Engineers, United States Army, supervisors of the project, presented the cost estimates of the two sites to railroad officials, who tentatively accepted the right-of-way through the dunes, with the important provision that the area had to be stabilized sufficiently to insure safe, efficient operation of their fast trains over the road.

Here was a job, a difficult undertaking in an area where the average annual rainfall is only 11.78 inches, and wind velocities are always rather high. The Corps of Engineers consulted the Department of Agriculture and a field agreement was signed whereby the Soil Conservation Service furnished the Corps technical assistance in making a work plan.

To gain information on sand dune stabilization under the climatic and physical conditions of the area a representative dune of about 125 acres was selected for tests to determine the effectiveness of the recommenda-

tions and to try certain other methods of stabilization not incorporated in the work plan.

The only evidence of plant growth on the demonstration dune when operations were started, June 16, 1939, was a few scattered plants of yucca, sage brush, and salt grass. The sand had blown from around the yucca and sage brush plants in some cases as much as 4 and 5 feet, leaving the abrupt mounds of original soil scattered over the area. In many places the sand piled up to 10 and 20 feet, with rather abrupt crests on the leeward side of the dune.

To get the land in condition for the operation of seeding equipment, the large yucca and sage plants were pushed over with a tractor bulldozer and removed. The crests were leveled with the bulldozer, and the excess sand pushed into the blow-out areas. The dunes were leveled as nearly as possible to conform to the characteristic underlying topography.

Afterwards, the area was seeded in alternate strips to several varieties of sorghums to determine which kind could best resist wind action and sand movement. Excellent stands of all sorghums were obtained, but none was able to withstand the strong winds and the blasting effect of the sweeping sand. Some plants were covered with sand to a depth of several inches; others were blown completely out of the ground.

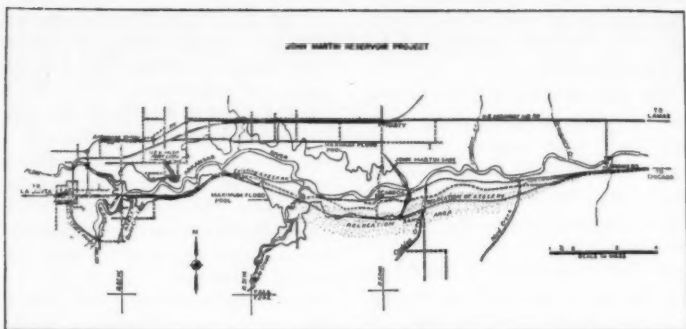
Seeding operations were repeated on different parts of the area with different types of equipment, such as grain drills, disk furrow openers, listers, and shovel-type drills. These methods were no more successful than those used for the first seedings.

With something like desperation, workers tried mulching, a practice with which gardeners on a small scale have long been familiar. Seeding was repeated on a small plot with the shovel-type lister drill, and a light covering of wheat straw mulch applied immediately after seeding. Here was the first success. The mulch prevented sand movement, reduced evaporation and the temperature of the surface soil, and allowed the seedlings to become established. The crop grew to sufficient height to produce an effective cover against wind erosion.

Success—With Mulching

The favorable results seemed conclusive that mulch would at least increase the possibilities of establishing vegetation, whether it be of temporary or permanent type. In order to observe further the effects of mulching and the possibilities of using winter grains as cover crops, with and without mulch, fall rye was seeded with a regular grain drill on approximately 70 acres. Half of this area was mulched with straw, at the rate of 6 tons to the acre. The other half was not mulched. The mulched portion survived throughout the winter and spring, and the rye produced a satisfactory cover crop. The unmulched portion of the area blew out and was completely destroyed soon after the plants emerged from the soil.

This experience showed that it was useless to attempt to grow cover crops, like grain sorghums or small grains, without first protecting it with some type of mulch. As wheat and barley straw was the most available and cheapest type of mulch, contracts were made with local farmers



for delivery of straw by truck to the site. Men with pitchforks spread the straw evenly over the area to a depth of approximately 3 inches. To prevent the movement of the mulch by wind, a heavily weighted V-type wheel land-packer was run over the straw to tuck it into the sand.

Since straw afforded the same protection from wind erosion that had been hoped for from the planting of annual cover crops, it was determined to plant native grasses and perennial shrubs at the time of mulching. Thus, a large amount of moisture was conserved for the establishment of permanent grasses and shrubs, which would otherwise be used by the cover crops. Grasses seeded in the fall of 1939, however, did not germinate until spring moisture was received, at which time the emergence of seedlings was satisfactory. Survival has been good so far.

The Corps of Engineers acquired title to about 5,200 acres adjacent to the railroad relocation and considered necessary for adequate protection and safe operation of fast trains. Of this acreage approximately 500

acres were in open, active, blowing dunes. Another 300 acres along the center line of the relocated tracks will be disturbed by road-bed construction, and will be in a blowing condition when the construction is completed in a few months. The rest of the area has a sparse covering of sage brush and weeds. All native grasses that once grew in the district were destroyed by drought and over-grazing during the past 4 or 5 years. Much of this latter area is potential blow sand territory.

It was determined that it would be desirable to plant this area to native grasses to obtain a more effective permanent stabilization to the area. To observe the results of fall grass seedings in the native cover of sage, 35 acres were seeded to grass in October 1939, with a double coulter disk-type drill. A mixture of grass seed that would be desirable for future seedings, consisting of Canada wild rye, Virginia wild rye, sand reed grass, blue grama, side-oats grama, blow-out grass, and sand dropseed, was used. The seed did not germinate, however, during the fall because of the lack of surface moisture, but with moisture during

the winter months, emergence of seedlings in the early spring was satisfactory.

To observe the effectiveness of trees and shrubs in establishing permanent vegetation, 29,200 cottonwoods and tamarix seedlings were planted on a mulched portion of the demonstration in March and April. Although it would not be economically feasible to plant the entire acreage to trees, there may be some critical areas where trees would be most effective and would offset the cost by their efficiency.

Operations were started outside the demonstration area in October 1939, and so far 450 acres have been mulched and seeded to native grass seed mixture.

It was estimated that the cost of stabilization by these methods will be approximately \$80 an acre. The entire cost to the Army engineers for putting the 5,200 acres in a safe condition will be approximately \$150,000 for the complete job.

\$80 An Acre for 50-cent Land

This cost, no doubt, could have been materially reduced had not the time factor been important; as only

two growing seasons were available for the establishment of permanent stabilization before this relocated track would be put into use, it was deemed advisable to resort to artificial methods rather than to depend upon Nature to establish the vegetative protection.

It looks like folly to spend \$80 an acre on land that normally sells from 50 cents to \$2.50 an acre, but in this case it was a matter of saving the cost of constructing the bridges, the purchase of a right-of-way through irrigated land, and the responsibility of making settlements over water rights and relocation of irrigation systems, which would be affected by such construction.

The information obtained from this project will be of practical value to farmers, not from the standpoint of going into the extensive stabilization of sand dunes, but of taking care of the small dunes that develop in dry, sandy range land. Small critical areas may be treated as they have been treated in the John Martin project; thus they can be prevented from growing into large, dangerous areas that the average ranchman cannot afford to fight.

Blame

There is no evidence that in historic times there was ever a severe enough drought to destroy the grass roots and cause wind erosion comparable with that which took place in 1934 and 1936; that phenomenon is chargeable to the plowing and over-cropping of comparatively recent years.

—THE FUTURE OF THE GREAT PLAINS

ABOUT THE PEOPLE

By Earl H. Bell

FOR 50 YEARS the population of the Southern Great Plains has fluctuated widely in reaction to rainfall and economic factors like prices.

For example, of the farmers in Haskell County, Kans., in 1895, 57 percent had left by 1905. Of those there in 1905, 53.8 percent had left by 1915. Of those there in 1925, 27.5 percent had migrated by 1930.

Behind the statistics are the blasted hopes and ambitions of thousands who invested their savings, toiled for a few years, depleted their resources, and left, only to be followed by others, enticed by promotional methods and temporarily favorable moisture conditions. Haskell County is in the Dust Bowl. Its soil is better than the average.

From 1900 to 1930, rapidly expanding industry absorbed the surplus farm population. Some of the dryland migrants became city workers. Others returned to farms in the Mississippi Valley. Others continued their trek westward.

The migration in and out of the Great Plains has meant that national wealth has been poured into the area in amounts almost equal to what it produced.

Even conservative and incomplete computations of this "private subsidy" are startling. A land use survey of 53 High Plains counties showed that 8,377,929 acres have been abandoned. At an estimate of \$20 an acre, the total loss of invested private capital in land alone would be \$167,558,580. On it are 10,485 abandoned houses, once worth perhaps \$20,970,000. Besides, there

were improvements such as fences and barns that would raise the total several millions of dollars. These amounts cannot but be considered as a subsidy to plains agriculture by private capital.

The basis of the problem today is not unlike that of 1890-1930, but several national factors make the social results more acute now—the failure of industry to expand in the past decade, so that population pressure upon the land has increased; the rapid mechanization of farming; a larger labor supply; changes in the sizes of farm units; drought.

In Haskell County during 8 years of drought, the average acreage of wheat harvested was only 28 percent of that planted; the average yield of acreage harvested was 4 bushels an acre. There were feed-crop failures, too.

I interviewed the heads of nearly all families in that county and asked, among other questions, how they managed to remain. All replied that if it had not been for the agricultural program they could not have held on. Most of them added that in the entire county not more than a half dozen families otherwise could have stayed. One business man said he opposed in principle Government aid to farmers but added:

"If it had not been for the agricultural program no one would be here now. I would not be here. The county would be grown up to weeds or blown away."

Two answers were given to a question as to why they remained. One was, "I don't know where else to go." The other, more frequent, was, "We like this country; it is a good country if we can just get rain."

YARDSTICKS AND THE FOUR-CARD DRAW

By H. H. FINNELL. Many wheat farmers of the Southern Great Plains have been accused of operating on the principle of everything to gain and nothing to lose. "Playing them blind" may be all right some times, but, with poker as an example, the advice is here given that the dryland farmer consider well his first four cards before staying in or making a raise.



"Playin' 'em blind" might be all right for a bunch of old maids, but our advice to the dryland farmer in the Southern Great Plains is to look at his cards before staying in, and especially before planking down a raise. It is not a game of everything to gain and nothing to lose, although many wheat farmers have been accused of playing it that way. Planting crops according to the calendar or signs of the moon, year after year, is altogether too much like gambling, and gambling in crop production in the Southern Plains area is neither altogether nice nor necessary.

One thing always to keep in mind in the semiarid region is that the making of a crop begins the minute the previous crop is off the land, regardless of whether the next crop is to be planted immediately or 18 to 24 months later. The progress of available soil fertility and soil moisture accumulation, which may or may not go on during the preparatory period, determines both the ex-

tent and the dependability of crop production.

Suppose you want to sow oats. The previous crop has just been harvested, either in the summer or the fall. The first thing you need to know is whether to plow, when to plow, and how to plow, in order to encourage a favorable fertility and moisture condition. Various crop residue and weed conditions as well as soil moisture determine the best steps to take. Then, having done what is within your power to influence and guide the forces of nature during this preparatory period, you come to sowing time in the late winter or early spring. The next thing you want to know is whether your efforts combined with the happen-so's of the season were successful in preparing a favorable crop-producing possibility. To take an inventory of the conditions is as simple as turning the cards over and looking at them. Now, if the hand is not to your liking, you can throw it in and wait for a new deal. If you hold the

hand and draw, other cards will be dealt between spring and summer.

The sorghum season is approached in almost exactly the same way. When sorghum planting time comes, however, it is rarely, if ever, necessary to pass. The results in this case depend mainly upon the size and kind of bet you make.

The Exciting Wheat Game

I realize I cannot go on much further without someone interrupting me and asking, "What about wheat?" Playing the wheat game is one of the most exciting because the stakes are high and the pot is big. But, it still is not a game of everything to win and nothing to lose, as many would-be wheat farmers in the Southern Plains will tell you.

You have doubtless witnessed many times the horrible example of a player who doesn't know when to pass. There are many fine points of science involved among the several decisions which need to be made in successfully guiding the preparation of the soil for the production of wheat; but, the most vital single factor in playing the wheat game is to learn when to pass and to have the sense to act promptly upon the conclusions of your best judgment.

The first wheat card is dealt during the month of July. Turn it up immediately and look at it. It is the July rainfall; it will tell you whether to disk, shovel, or list, or to let the stubble stand. It represents the kind of opportunity you have for effective soil preparation. Whatever its indications may be, don't forget about it because it will still be in the game as harvest approaches next year.

The next three cards will be dealt in September. They are No. 2, the

soil moisture store, No. 3, the accumulated amount of available nitrogen, and No. 4, the incorporated unrotted trashy residue from the previous crop.

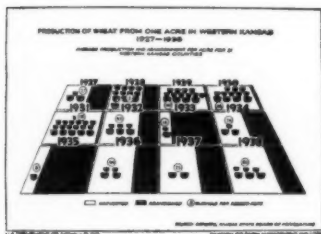
The most important thing not to do at this time is to bet or pass without looking at these first four cards. To be sure, there is a fifth card required to make out the hand, but it will not be dealt until the following spring. The decision has to be made upon the basis of the four cards in hand. If only one of them is good, the best you can do is draw a pair and the chances are against that. Suppose two of the cards are good. A pair is not worth much and the chances of drawing another to make three of a kind are even more remote. But, if you are holding three good cards, or four, it doesn't matter so much what the next spring deal turns out to be. Anybody who does not know what to do in any of these circumstances certainly has a lot to learn. I reiterate there may be a terrific wallop in playing them blind but I believe most players will agree that it is a better game to look at your cards, evaluate them, and play them for what they are worth.

Barging along blithely, not knowing what you are going to do from one month to another, is admittedly one of the most radical ideas introduced into crop management in a long time, but it is not nearly so haphazard as it may seem at first glance. It is not as haphazard, in fact, as planning ahead on conditions you cannot foretell. The result is a flexible crop rotation. The basic pattern of the rotation may be determined in any desired manner, so long as it is within the range of practicability and

consistent with the potentialities of the soil resources in hand.

A Systematic Cropping Plan

A system of flexible crop management under semiarid conditions has an exact counterpart in principle under humid conditions. In both cases, the cropping system has been devised to be consistent with the natural conditions which control production. Under humid conditions, scientific research and agricultural experience combine in agreement upon a systematic cropping plan, but this is



only because the natural conditions which afford crop production possibilities are systematic. They are sufficiently regular and capable of anticipation that it is not only possible but desirable that production be planned systematically and far in advance.

The principle of basing crop plans on known possibilities has very successfully prevailed under conditions of humid agriculture. The adaptation of this principle to dryland agriculture does no violence to the principle of crop rotation but it introduces flexibility because the seasonal sequence of conditions in the semi-arid belt is unsystematically variable. A rational application of the accepted crop management principles requires

the recognition of seasonal variability, the evaluation of it, and the progressive shaping of crop plans according to the accumulating effects of varying conditions.

The degree of flexibility should increase along with arid conditions until a point is reached where the frequency of crop-producing opportunities is so low that necessary protective ground cover to prevent wind erosion cannot be maintained without irrigation.

The Idea of Diversification

You are at liberty to accept conditions as they come or to create conditions for yourself within certain limits. In any event, the principle of planning crop production to take advantage of the soil conditions, whether they be systematic or unsystematic, is the same the world over.

The fault with the wheat farmer has not been so much a failure to accept the fact of variable seasonal conditions, as it has been his lack of acceptance of the idea of diversification. In this respect, of course, he is a generation or two behind humid agriculture in thought.

What the plains farmers lack in dependability of seasonal conditions they may well make up in the capacity of the deep semi-arid soils to accumulate in advance and hold in readiness for use both the moisture and the available plant food required to produce a crop.

The past failures of Southern Plains agriculture more often have been due to efforts to superimpose a system of regular crop management upon an unsystematic set of natural conditions, than to inadequate natural resources. A thing is not necessarily unreliable because it is unsys-

tematic. Obviously any ill-fitting methods of utilization will be very unreliable, if merely by being mistaken or untimely they fail to lay hold of the currently available soil resources.

In the case of winter wheat, the crop which occupies the land for the longest period of time among those climatically adapted to the Southern Plains region, it has been revealed by research that roughly 65 percent of the influence which may be brought to bear in determining what the yield of grain will be, has already been brought to bear in the soil at the time of sowing the crop. In other words, what it takes to produce wheat has in a large measure already transpired or has been accumulated in the soil by the time it is necessary to decide whether to plant.

Depending on Disadvantages

With other types of crops, which occupy the land for shorter seasons and therefore are subject to less of the hazard of seasonal uncertainty than winter wheat, it is possible to be even more sure of existing production possibilities at planting time. Planning the sowing of spring grain or the planting of summer feed crops may be undertaken with equal or better assurance than winter wheat.

With all the inconsistencies of the plains climate, there are some dependable features. It is recognized that winter follows summer with a reasonable degree of regularity. This is important to consider in planning farm operations, but what is more important, is the fact that the amount and distribution of rainfall varies unsystematically. This is a sort of disadvantage to anyone who

would like to plan a systematic rotation for crops, but, shall we say, it is a disadvantage we can depend upon.

It is this unsystematic variation in the amount and distribution of rainfall that creates the year-to-year variations in crop-producing possibilities. Human nature already possesses a sufficient amount of curiosity and daily personal interest in the subject of weather that it does not require a big effort to follow intelligently the progress of seasonal conditions. This continual and involuntary weather consciousness on our part might as well be lumped in with the other natural factors with which we have to deal in mastering the skill of land utilization.

Actually, the farmer is not nearly so completely at the mercy of seasonal variations as might at first appear. There are six different successive periods during the year when he has the opportunity of making important decisions relative to land preparation and crop management, decisions which should be based upon an appraisal of existing soil and moisture conditions.

Along with these several mileposts in the cycle of crop succession goes also the opportunity definitely to contribute something to the hastening of, or the bettering of, the next favorable crop producing opportunity. This is especially true in regard to water conservation. If the simple objective be followed of saving all the water possible, storing it in the soil within the root zone of common crops until enough has been accumulated to assure the successful production of the next adapted crop in season, and at the same time so managing the tillage operations and

Population

What we may expect is that population trends will be integral parts of the trends in cultural patterns. If the patterns are in the direction of noncommercial agriculture, farm birth rates will fall relatively slowly; if they are in the direction of an ever-increasing commercialization of agriculture, they will probably fall faster.

—CARL C. TAYLOR

grazing of the fields as to preserve the trashy residue of the previous crop needed to prevent wind erosion, the maximum efficiency of soil and water utilization consistent with safety against erosion hazards will have been achieved.

The soil and water relations of the Southern High Plains being what they are, the climatic conditions of this area being what they are, the list of adapted crops being what it is, and agricultural economics being what it is, you just naturally find yourself practicing diversification by means of a flexible cropping system almost without premeditation or design. It is the natural, the practical, and the scientific thing to do.

No Mysterious Formula

Research work and experience in the field of crop management as applied to the various problem areas in the Southern Great Plains region are

still in an elementary stage. Much has been said about the spectacular results of water conservation research and the even more spectacular demonstrations of farmer utilization of water conservation practices, but the stabilized increase of production by means of crop management practices is fully equal in value. The gains in efficiency of land utilization, which are potentially available to the farmer through crop management practices, may undoubtedly be intensified if overlaid upon an effective system of water conservation, but the principle applies and the possibilities exist just the same where water conservation opportunities do not exist or even where they exist and are neglected.

Experimentally, the correlated practices of water conservation and productive crop management have provided the most effective safeguard against wind erosion and at the same time the most efficient known utilization of soil resources. The coordination of water conservation and crop management is natural and easy. When the same relation is generally recognized between seasonal variability and flexible rotation as now exists between drouth and water conservation methods, a major problem of land utilization in the Southern Plains area will have been solved. Making crop planning a continuous process should not in any way detract from the dignity of the task. The productive value of timely and appropriate variation is surprising.

That the forecasting of crop producing possibilities at sowing time is quite reliable is due not to any mysterious formula for foretelling events. It is entirely based on the proper evaluation of significant events that have already transpired.

Awakening INTEREST IN GRASSLAND FARMING

A SYMPOSIUM. "Next in importance to the divine profusion of water, light, and air, those three physical facts which render existence possible," said John J. Ingalls, "may be reckoned the universal beneficence of grass." Several conferences in various parts of the United States this summer were based on that theme. Excerpts are here presented from four addresses given at the Southern Great Plains Grassland Conference in Amarillo, September 5 and 6.

USES AND VALUES OF GRASS

By P. V. Cardon

IT HAS been roughly estimated that approximately 60 percent of the total land area of the United States is grazed at least part of the year. The forage annually grazed from this vast acreage, plus the supplemental feed crops taken from many additional acres, is said to approximate half of the total value of all crops produced each year in this country.

If these are to be accepted as reasonable approximations, then one might infer that grass already occupies a dominant position in American agriculture and that there is little if any further place for grassland areas.

Such an inference, however, is not warranted by underlying facts. These facts need only to be mentioned in order to reveal clear and urgent reasons for judiciously ex-

panding the grasslands of this country and for developing ways and means of utilizing economically the old and the new grasslands alike.

The first outstanding fact to be regarded is that practically all of the land now in grass in this country is land generally unsuited to the production of cultivated crops.

Second, as a result of the general tendency among Americans during the last hundred years, particularly, extensive grassland areas have been broken which should have remained in grass since they are not suited to other crops.

A third fact is that much of the land now in crops other than grass would be benefited by being returned temporarily to grass. This is the basic fact underlying soil conservation measures aimed at holding soil in place or at improving the soil structure, the chemical composition

of, and the biological activities in, the soil.

A fourth fact is that grass may be grown advantageously, as circumstances warrant, to replace crops in surplus production and thereby aid in balancing the agricultural output of the Nation. This, in part, is the basis of recent agricultural adjustment activities. There is reason to believe that in meeting the impact of present disturbed international relations, grass will play an increasingly important part in effecting crop acreage adjustments.

A fifth fact is that by according to grass its rightful place as a crop in American agriculture, we can produce not only more but better grass and thereby derive from it larger benefits.

These, and other, facts have been recognized and taken into account in connection with recent national agricultural activities, the outstanding result of which is to turn America toward a grassland agriculture. This is a logical development and it is becoming more and more defensible as this country strives to adjust its farming to a drastically changed and continually changing situation.

I URGE a shift of emphasis in our talk about grass. I would not lose sight of or neglect the incidental values of grass as a tool in preventing erosion or in meeting any other soil conservation problem, but I would stress the importance of grass as a farm crop worthy of as good land and as much managerial skill as any other crop. And I would emphasize particularly the importance of determining more clearly the place that grass may occupy in farm practice in order

that the farmer might derive from its culture all of the benefits to which he is reasonably entitled.

I have said that the extent to which farmers find that they can use grass to advantage will determine its place in agriculture. Now grass has many uses. Even in seeming idleness it has value. It holds and enriches the soil, even when neglected as a crop and allowed to stand untrammelled.

But it is in its economic use that grass is most valuable. It may be valuable as a soil cover while "idle" but, in an economic sense, it must pay its way. The farmer must see that it pays to plant grass, if he is to retain a continuing interest in planting it. He may believe in all that he is told about the social importance of preserving the land for future generations of farmers, but he has the immediate concern of making a living, of housing, feeding, and clothing his family; and of being able to pay his taxes, support his church, and take an occasional vacation.

Farmers generally are more conscious of grass values today than ever before, and many of them believe, if they do not know, that grass pays. Some of the ways in which they believe it pays are these: While serving as a source of feed it covers the land and protects it, at the same time improving the soil structure as well as inducing favorable chemical and biological changes in the soil. Then, when in favorable locations its place is to be taken by the next crop in sequence, grass is turned under and continues for a time to enrich the soil, to an extent measurable in the yield of succeeding crops.

But whether these obvious and well-known uses of grass pay in

measurable monetary profits is still largely a matter of conjecture.

GRASS CULTURE if it is to be made profitable, however, demands good grassland management. And good grassland management calls for knowledge of how to establish and maintain grass and how to use it to best advantage. This entails knowledge of grass species, their habits, and cultural requirements. It entails also a knowledge of fertilizers and their use on grass, if their use in a given region is practicable. It entails, finally, a knowledge of grazing practices likely to get the most out of grass while retaining it as a desirable land cover.

But I would stress the fact that in grassland farming, good management combines all of the skills of soil management and crop husbandry and in most instances of livestock management. So when we think of grassland agriculture, we are not thinking of a return to extensive, pastoral farming but rather of an advance toward a high type of intensive farming.

Grassland agriculture, as I see it, is a flexible agriculture, adjustable to national needs. It does not presume that all land is to become and remain permanently as grassland although much of it may do so, particularly the land not suited to tillage. Where conditions permit, however, this type of agriculture presumes a periodic breaking of grassland in preparation for other crops. The total grass acreage consequently may be expanded or reduced to meet individual, local, regional, or national interests. Grassland agriculture, in brief, is a process of balancing crop and livestock production.

AS IT ONCE WAS

By W. G. McGinnies

THE GREAT grassland area of the United States lies between the western and eastern forest belts and extends from Canada to Mexico. This grassland area, broken only by river courses and occasional buttes or lone mountains, is characteristically an area in which trees have failed to develop either because of unfavorable soil conditions, poor drainage, and aeration, intense cold and wind, deficient moisture supply, or repeated fires. Grasses of one kind or another are admirably suited to withstand conditions of excess moisture, excess drought, and fires which would destroy tree growth.

The 100th meridian roughly marks the division between the prairie grassland on the east and the shortgrass or plains grassland on the west, while south of the shortgrass in the higher land of west Texas and lower southern parts of New Mexico and Arizona is to be found the mesquite grassland.

Our concept of the grassland vegetation prior to the arrival of the Indian was that more or less of a biological equilibrium had been reached within the bounds set by climate and soil. Grazing animals probably were never sufficiently abundant to cause widespread overgrazing, and fires were sporadic and relatively infrequent.

Little is known of the relation between early Indian cultures and the grassland vegetation. Prior to the introduction of the horse, evidence tends to show that the condition of the Indians was poor. The plains had had no agriculture and supplied little or no wild fruit and no nuts.

The Indians were dependent on game, and although game was not scarce, it was, with the single exception of the buffalo, very wild and wary and could be approached on foot only with the greatest difficulty.

WITH THE COMING of the horse, the whole life and economy of the plains Indians were changed. So important was the horse that anthropologists have named the period extending from 1540 to 1880 the "Horse-culture Period." It was the horse and the buffalo, but primarily the horse, that enabled the plains Indians to hold out against the white man. During this period the grassland area was subject to the influence of grazing by buffalo, antelope, horses, and other herbivores and at the same time was strongly influenced by recurrent fires, many of which were set by the Indians.

Between 1540 and 1784 horses spread to all the plains tribes and even into the forested regions, but it was in the plains area that the development was greatest.

It was during the period dominated by the Indian and his horse that the buffalo reached its greatest abundance. Authorities differ as to the numbers of buffalo, but all agree that they were very numerous. Hornaday estimates that the herds might have totaled 12,000,000 and they certainly reached 4,000,000. Jared Smith, on the basis of information available, estimated that 4,000,000 buffalo grazed in the district south of the Platte River, retiring to the plains of western Texas and the Indian Territory at the approach of winter.

Most authorities agree the combined influence of grazing animals, including rabbits, prairie dogs, ante-

lope, buffalo, and wild horses, resulted in widespread overgrazing prior to 1850 and that following this date there was a great increase in the growth of vegetation as the numbers of native animals declined.

As the number of buffalo decreased during the third quarter of the nineteenth century, there was a notable increase in the growth and luxuriance of the grass. It was this grass growing under favorable conditions and light grazing use that gave the early stockmen their rather extravagant ideas of the grazing capacity of the prairie-plains region.

FOR OVER three and one-half centuries following the discovery of America, the great grassland area remained a virgin territory as far as settlement by the white man was concerned. Then, within the span of a single lifetime, the grassland area was taken from the Indian and the buffalo and built into a gigantic cattle kingdom which later gave way to an agricultural empire. The delay in development was due to geographical location, inexperience of the early settlers, and unfriendly Indians.

The early Spanish explorers found no gold and little else to interest them in the plains region. While several expeditions were made into the grassland area, no serious attempt was made for colonization.

As far as most of the plains area is concerned, it can be said that Spaniards left it as they found it. They did exert an important influence on the southern and western edges, but for the most part, they played a minor role in the development of the grassland area.

During the first half of the nineteenth century the advance guard of

the English-speaking forest dwellers began to emerge into this new environment where there were no forests, no logs for cabins, no rails for fences, and only a few springs and running streams. These pioneers, equipped with the weapons, tools, ideas, and institutions which had served them in the forested areas now set out to conquer a new environment. Their effort constitutes a gigantic human experiment with an environment.

The relation of man to his environment is similar to that of any other organism. However, man is a very highly adaptable organism and at the same time has a great power to modify the environment to suit his needs. In spite of these characteristics, civilized man encountered many obstacles in the development of the plains, but once he gained a foothold he moved rapidly—perhaps too rapidly to conquer and subjugate this great grassland area.

In 1870 it is estimated that there were 5,000,000 head of cattle in Texas, and at that time these cattle were largely confined to the eastern settlements and southwest Texas. Records indicate that practically no cattle at that time were to be found west of the 99th meridian. In fact, in 1880 after the kingdom had spread, fewer than a million cattle were to be found west of the 100th meridian.

Trailing livestock to markets was an hazardous adventure, but in spite of the difficulties to be overcome, more than 4 million cattle were delivered to northern shipping points between 1866 and 1880. In addition, many herds were turned directly west to the ranges of New Mexico, Arizona, and Colorado. Others

went to Montana, Wyoming, and the Dakotas, and some into Canada. Despite this migration of cattle, the number remaining on the home ranges of Texas was greater than before.

THE SPREAD of the range and ranch cattle industry over the Great Plains in the space of 15 years is one of the outstanding developments in American history. While the development of the cattle kingdom was complete within itself, it was subject to the general conditions of the Nation. It was affected by economic conditions in the East, such as the panics of 1873 and 1893 and the boom of 1885. It was affected by the railroad extension, the invention of barbed wire, and the adaptation of the windmill, and finally, it was affected by the immigration of the small farmer.

The great boom of the early eighties was a time of golden visions—a brief era of wild extravagance in theories and in practices. Several railroads had crossed the plains.

Money was plentiful in the country as a whole and was seeking an outlet for investment. The eastern part of the United States was becoming more crowded and farmers were pushing farther and farther into the cattle country. Finally the Indians had been reduced and were strictly controlled so that people were no longer held back from the plains by fear of the scalping knife and the tomahawk.

In 1885 the bubble burst. The winter of 1885-86 was severe from Kansas southward to Texas and New Mexico. It is reported that 85 percent of the cattle were killed in some areas. In the North, the summer of 1886 was hot and dry. Grass was

short and cattle were forced on the market at reduced prices. In November severe winter set in with blizzard following blizzard. It is estimated that livestock suffered a mortality of 40 to 60 percent.

Disaster followed disaster. There was a severe drought in the Southwest in 1886; in Colorado in 1888-90; in the plains and Southwest in 1893 and 1894.

Financial confidence which had been built up in the early 1880's started to weaken in 1885 and was completely upset during the winter of 1886-87. When the depression caused loans to be called, credit liquidation brought forced sales and bankruptcies. Thus ended the bonanza period of the cattle kingdom.

It is quite possible that this brief period of overuse would have resulted in but little permanent damage to the range if it had not been for the arrival of the farmer whose activities resulted in further and further restriction of the range area, so that adjustments in livestock numbers always lagged behind the ever decreasing grazing capacity.

The plowman invaded the grassland area in the east central region and spread northward and southward as he advanced to the west. His invasion was held back by his forest heritage, warlike Indians, lack of building and fence materials. His former prejudices were discarded when he found that the grassland produced excellent crops, and without the drudgery of clearing timberland. The development of the repeating rifle and the Colt revolver took care of the Indian problem. The invention of barbed wire solved his fencing problems and the railroads transported building materials

to him, and his farm products to the eastern market.

Once started, there was nothing that could stop him; heedless of all warnings he moved further and further west into drier and drier areas.

NATURE'S WAY

By O. S. Aamodt

THE PLANTS that persist naturally in any given region over a long period of time are the ones that have been successful in adjusting themselves to the factors that limit the growth of vegetation. In order to survive in any given region, the plants would have to withstand the extremes in drought, cold, wind, insect, diseases, and competition with other plants common to the region in which they are grown. Those species and varieties of plants that can grow to maturity and reproduce in competition with other plants are the ones that are selected by Nature's "fit and try" process to cover the land.

The crop map of the United States was developed by the farmers from the time they first settled on our eastern shores and began to destroy the natural vegetation and substitute for it various kinds of cultivated and grassland crops. This substitution began in the Eastern States and gradually progressed westward until practically all land of any agricultural value was covered with crops instead of the natural vegetation developed by Nature.

When the farmers brought with them crop seeds from the Old World, they carried on a process of "fit and try" very much as Nature did to find out which crops were best adapted. The only difference was in time, the farmer taking a few hundred years

to make a pattern that took Nature many thousands of years.

As time went on, the farmer found that the European varieties were not so well suited to the soil and climate that existed on this continent as they were to the conditions that existed in Europe and he proceeded to develop new varieties. Later, the agricultural experimental institutions, both State and Federal, came to his assistance and helped to develop not only varieties that were better adapted but also better methods for seeding, cultivating, and harvesting the crops.

Diseases, insects, and weeds became more prevalent and the experiment stations helped the farmers develop better methods for the control of these pests. The success of our agriculture is measured to a large extent by the degree to which we have been successful in substituting adapted crops for Nature's adapted vegetation. Naturally, the farmer found, just as Nature did, that in certain regions the climatic and soil conditions were such that certain kinds of vegetation did better than others.

THERE IS a remarkable similarity between the map showing the various kinds of natural vegetation that covered the United States before it was destroyed by the woodsman's ax and turned under by plow, and the map showing the type of farming in the various sections of the country today. For many years the botanists and foresters of the United States have recorded the type of natural vegetation that existed as a permanent cover on the land.

This similarity between the type of natural vegetation and the type of farming is not merely a coinci-

dence. The growth of plants developed by Nature or developed by man are influenced in their adaptational requirements by the same dominating climate. Vegetation must be adjusted to fit into the prevailing climatic conditions. Any failure to do so brings about increased hazards to the crop. Nature carries on a program of conservation at an equilibrium determined by the climax vegetation. Man carries on a program of soil use in which he works toward an equilibrium determined by his cropping system and by the efficiency with which he has managed the soil. It is possible to build up soils responsible to treatment with grass and proper management.

New varieties are needed. There is a change in environment—even more than there was 75 years ago. In some other part of the world there may be species that will grow better in this area even than the native grasses that have grown here for some 75 years.

We have tried to find what we are breeding for, in terms of environment. A farmer throws away what does not fit into his environment, and grows something else. It is not a case of throwing away grass and getting something else; it is a case of finding a grass that will fit into this new environment.

And let me emphasize that the environment of soil and make-up of the soil and even the weather are not the same environment that was here 50, 100, or even 200 years ago. We need in this region a type of plant that will grow luxuriantly in the early spring and late fall, at a time when other species are not growing very luxuriantly.

One of the most striking things I have seen is the remarkably limited stabilization of most of our main species in the West. Grasses that are indigenous to the South lose their hardiness when moved north; northern grasses lose their value when moved south. Most species of grasses have a limitation of 200 miles. Any grass grown here well must be able to reseed easily and must be free from any weedy habits.

We have found in experimentations that some grasses and legumes, or grasses and some weeds, have a distinct antagonism for each other. Why, we don't know. I am wondering if some antagonism between the native grasses and weeds causes the enormous failure of our grasses to grow in this area. We need research, such as that that has been made in corn, and until we do have that research, we shall not have much progress in the growth of grass.

NEW DIRECTIONS

By Sydney H. Watson

FARMERS AND RANCHERS who have attempted to put land back to grass in the Southern Great Plains realize that it is a difficult task, and there is no question but that getting grass back on 6 to 8 million acres of land in this semiarid area is the biggest revegetation problem in the United States.

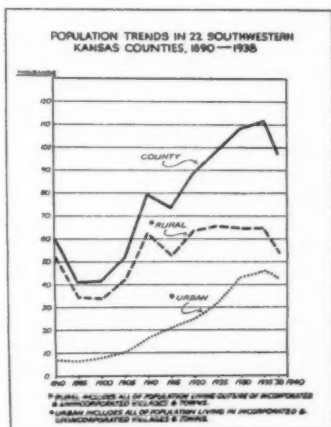
Under favorable conditions natural revegetation may be very rapid as evidenced by the fact that a fairly satisfactory grass cover may be found on fields which have been out of cultivation less than 5 years. As opposed to this rapid recovery are fields which have not been cultivated for

the past 40 or 50 years and yet little or no grass is to be found.

These wide ranges in length of time required for natural revegetation are influenced by many factors, some of which are: Number of years cultivated, intensity of cultivation, type of soil, amount and distribution of rainfall, degree of erosion, type of vegetation common to the area, intensity of grazing, adjacent blow hazards, and proximity to grassland which might serve as a source of seed.

In both natural and artificial revegetation the first step toward establishing grass is to obtain stabilization, or in other words, stop land from blowing.

In natural revegetation the goal is to obtain a weed growth as soon as possible and maintain this growth until more desirable vegetation has replaced the weeds, whereas in artificial revegetation an attempt is made to retard or minimize weed growth while "seeded grasses" are becoming established.



Meeting Today's NEEDS IN THE LAND OF MANANA

By GLEN GRISHAM. *Where Europeans first established colonies in the United States there remain Old-World customs, speech, habits, thought. And there are poverty, isolation, wornout farms and farming systems—"one of the most challenging problems," Mr. Grisham says, "of human and land use adjustment planning in the Nation."*



Northern New Mexico, particularly the areas drained by the upper Pecos and the Rio Grande, was the scene of the first European colonies in the United States. A thousand years before the Spaniards came, Indians settled in the region.

The Spanish-American villagers, who now comprise the major part of the population, are located on small, irrigated, but inadequate land holdings along the major water courses.

In former years, the Spanish-Americans had access to considerable range land near their farms on which they ran herds of livestock. Since 1890, the control of range lands by commercial livestock interests has steadily increased, and many community pastures have been acquired by these operators.

The natives were driven back to their irrigated acreages and began to depend upon outside work for supplemental income formerly provided by livestock. Since the decline of the labor market about 1930, Government relief agencies have provided much of the cash for buying clothing

and food. But because of the peculiar nature of the economy in these Spanish-American communities, the available relief programs could give only limited assistance.

Today this area presents one of the most challenging problems of human and land use adjustment planning in the Nation. Those familiar with the complex circumstances believed it advisable to develop a pattern of assistance that would be applicable to the situation and acceptable to the population. Consequently, in attempts to work out a program of self-subsistence for these families, the Farm Security Administration worked out an experimental plan in the village of El Pueblo in February, 1939.

The Beginnings of the Spanish Folkways

Factors contributing to the present situation are most easily defined by tracing the history of these communities and studying the characteristics of the natives and their physical resources.

Oñate's entrada in 1598, in which he brought 400 colonists to settle at

San Gabriel near the junction of the Chama and the Rio Grande, formed the nucleus of a purely Spanish culture whose traditions were so intensified in isolation that were one of the original colonists living now he would see very little difference in the folkways and customs. The speech of today, with its pithy proverbs and grandiloquence, retains the wit and character of Andalusia.

There are many reminders—in architecture, cookery, language, and customs—of the colorful days of the early Spaniards in New Mexico. The natives are still temperamentally much the same as were their fathers. Their culture, modified by the evolution of long isolation and poverty, is still distinctly Spanish in speech, customs, and religion.

In the dry, clean air of the Southwest all things change slowly; growth is slow, and decay even slower. Here, in these forgotten valleys, wheat is cut by hand. Goats and horses stamp out the grain on mud threshing floors before it is winnowed by hand. Blue corn for atold and tamales is prepared with the metate and mano. Wheat is ground in the local molino between pumice stone grinders run by water wheels. Staple foods are corn, pinto beans, chili, dried fruits, and squash.

New Mexico is called the land of *manana*. It is also the land of today—the philosophy of enjoying today permeates the country. *Manana* is that nebulous tomorrow for work and worries. The native lives to be happy today—not that he must slave today to be prosperous 20 years from now. Today there is God's sunshine; tomorrow may never come and, if it does, the Lord will provide children to care for old age. *Fiestas*,

bailes, and masses weave a happy, simple pattern of life.

Cash is always scarce and so are the necessities of life, but poverty is clothed in dignity. Los pobres live on meager incomes and the free dones de Dios sustain their racial pride with a quiet grace, like the dwarfed juniper and pinon that live close to the ground to conserve their sustenance. Farming and running livestock have been the heritage of the people for generations. They have no background or aptitude for industrial work.

Isolated as they are, with few facilities for improvement and few opportunities to learn of better methods, they have continued to farm as their fathers farmed before them. They plow their land 3 or 4 inches deep with a 10-inch plow and a pair of 600-pound ponies, broadcast grain by hand, and then go over it with a harrow. They have no knowledge of crop rotation, except that they plant alfalfa when they can get money for seed. The soil originally was rich in lime and plant nutrients, but the continuous cropping of corn and wheat has depleted it so that yields are no more than half of those produced in the memory of present inhabitants.

Romance—and Poverty

Early Spanish settlers sent their children to Mexico, New Orleans, St. Louis, or Europe for an education; or, if a family was too poor the children simply did not learn to read and write. The first effective public school law, enacted by the territorial government in 1891, provided for 3 or 4 months of operation each year. Not until 1912 were provisions made for county high schools, whose estab-

lishment was voluntary on the part of the counties. Educational facilities for rural people have never been easily available. Today, one of the larger counties in northern New Mexico, densely populated and class A in taxation rank, has high schools only in the county seat and one other town.

Agricultural extension work has not reached the valley communities. Natives, not realizing the benefits they could receive from agricultural workers, have not cooperated to the extent that those in other communities have. Because the native is a part-time farmer and is frequently away from home, it is difficult to carry out farm improvement programs.

Thus, we have a picture of rural northern New Mexico. Similar conditions obtain in El Pueblo, a farming community 29 miles southwest of Las Vegas and 5 miles south of the Las Vegas-Santa Fe Highway on the Pecos River. Most of the houses are grouped in pueblo-type villages, built against the hillside above the ditch.

Most farms, of 5 and 6 acres, have large, adobe houses that lack all sanitary facilities, except one or two small windows in each room and a fireplace, which heats the room and provides a source of ventilation. The Pecos, which may have been free from contamination in the early days of the settlement, has continued to be the main source of water supply. Medical service was not available until recent years when the United States Health Department began sending county health nurses into the community. Nature was the only safeguard against disease.

The average annual cash income of the El Pueblo families in 1938 was \$280. The figure is based upon the incomes of 53 families, the heads of which are able-bodied or which have some members of the family able to work, and do not take into account the 8 who are old, sick, or crippled, and get old-age pensions or other assistance. Of the 53 incomes averaged, 27 represent WPA wages, and 11 represent salaries from private employment. This average does not necessarily reflect the standard of living, as in almost every case those working depended upon their wages for their total needs and did not attempt to produce any of their living. These people do not know what good health is nor what constitutes an adequate standard of living. The average family consists of 5.4 persons.

An old custom, handed down from generation to generation, whereby a father divides his land among his children, has broken down the original large holdings into narrow strips of farm land, many of which now are not more than 20 yards wide and vary from 1 to 6 acres in area.

It has been impossible under the system of farming practices for a family to make a living from its small tract. This in itself constitutes a serious problem. All the available farm land is occupied; there is no room for expansion. To help a few increase the size of their units would mean the displacement of another group in like circumstances.

Not by Bread Alone

Obviously, the point of attack is the family, the home where it lives, and

the land where it works. The first need was to provide for the physical necessities of life. It is not possible to develop in a man a broader outlook on life, to enlarge his vision, nor to teach him to look to higher standards when he and his family are undernourished, poorly clothed, and inadequately housed.

Through generations of life close to the soil, these people have developed an intense love of the land and regard it as a home and a living. It is not a resource to be bought and sold or speculated upon. It is regarded as an integral part of their lives and of their families. But they have sacrificed their future prosperity in their abuse of the land to meet immediate needs.

Work grants became available at the start of the experimental program to meet the immediate needs of the family. An improvement program was worked out with each family, and numerous technical aids were provided.

It is necessary to remake the vision of the community. Group activities in which the people now participate have been allowed to become more or less routine activities found only in the organization and maintenance of irrigation ditches, in school, and in the church. Horses may be loaned, but machines seldom, if ever, except to a close relative. Strict accounting is kept of any such loan or of exchanged work, and payment in kind is expected.

Since the inception of the program, community consciousness and activity have been encouraged. A committee, chosen by the people, has functioned as a nucleus in the pro-

motion of the community welfare. Funds providing for the purchase of garden seed, baby chicks, fertilizer, canning equipment, material for screens and doors, nursery stock, and similar items were deposited with the secretary and the quantity purchases resulted in savings to individual families.

A community building was constructed by the people. Facilities are now available for group social and educational activities. Equipment will be provided for weaving, sewing, cooking, blacksmithing, and woodworking.

It was absolutely essential that farming units be enlarged or some additional resources be made available, from which supplemental income could be derived. Although land was not available which could be used to increase their farming units except at the expense of others, an opportunity did exist for the acquisition of additional grazing land.

Late in 1939 the New Mexico Rural Rehabilitation Corporation purchased 26,464 acres of pasture land, lying within 3 miles of the El Pueblo farms. Cooperative control of this land is vested in the Farm Security Administration and the El Pueblo people. Stock pens, scales, and all livestock shipping facilities are available. As the land is to be used strictly for range purposes for an established community, no housing facilities are needed. It is proposed to begin using this grass land in 1941 as a community pasture to accommodate subsistence herds for 50 El Pueblo families. Development work, like fence building, construction of soil conservation structures, and stock dams, is going forward.

Cooperation in Building and Buying

To achieve the goal—to enable all families in the community to achieve and maintain an adequate standard of living and possibly to point the way for similar work in other communities—conditions must be improved along all lines and every opportunity or resource must be utilized.

Work done in the first year to improve farm and home conditions, develop community enterprise, and to make more resources available will serve as a general foundation upon which the general program can be projected. Improvements in sanitary facilities, diets, land use, and farm and home record keeping are, to an extent, superficial, because the need for them and their value (except in relatively few instances) have not penetrated the consciousness of the people. Many improvements have been made and records are being kept simply because they are required.

Cooperative purchasing and the building of the community house have been carried out as informally as possible and will continue to be so

handled until the people have learned the real meaning of cooperative effort, have developed sufficient leadership within the community, and have shown sufficient interest and understanding as to be able to assume a part of the responsibility for the actual policies of operation.

The first step in providing additional resources for use of the people is not yet completed, and even after the pasture unit is stocked and operating it is not assumed that the people will be immediately capable of its management. The ultimate realization of the objective will evolve only from a well-planned and efficiently executed educational program.

An uneducated people, culturally, socially, and emotionally bound to the tradition of their grandfathers, ignorant of what lies within their reach, with no knowledge of how to reach for it, they must be awakened to a realization of their needs; a consciousness of their aptitudes, and an eager desire for progress.

From this will come a pattern for the rehabilitation of the El Pueblo community which can then be projected upon a larger scale for the assistance of similarly situated groups in other localities.

Balance

Nature has established a balance in the Great Plains by what in human terms would be called the method of trial and error. The white man has disturbed this balance; he must restore it or devise a new one of his own.

—THE FUTURE OF THE GREAT PLAINS

WALTER PLAGGE

—ONE WHO STAYED IN THE DUST BOWL

By NORMAN G. FULLER. *Much has been written about what happened in California to fugitives from the Dust Bowl. Here is an article about a man who bravely kept on farming in the heart of the drought area and is winning against big odds.*



In 1930 there were a few more than 1,700 families in Baca County, Colo. Today there are only 650.

One of them is Walter H. Plagge.

Things looked bright the first 2 years after his arrival in 1929 from Kansas, where land, at \$130 an acre, was too costly for him to buy. He had a bumper wheat crop in 1930. Baca County never had had a bigger wheat harvest than that of 1931, but that year the price was only 25 cents a bushel.

In 1932 the drought began. Wheat almost failed, but Plagge made a fair feed crop of sorghums and corn. Wheat failed in 1933, and feed was short.

In 1934 the dust storms came.

"It was a bad year," Plagge recalls. "The dust started blowing in the early spring. It hardly missed a day all summer long. We didn't have any of those 'black roller' storms, but dust was in the air nearly every day."

Practically no crops of any kind were made in Baca County in 1934. In 1935 the dust came again. The worst dust storm Plagge ever saw was the "black roller" of April 1935.

A "black roller" in Baca County is impressive and terrifying. The dust can be seen while it is yet miles away over the prairies. Usually an almost dead calm precedes it, but as one watches the approach of the great perpendicular wall of black dust intershot with swirling gray, one knows that there is a tremendous wind behind it.

The dust storm of 1935 was probably the worst that ever hit the plains. It started in northeastern Colorado and northwest Kansas and swept south across the plains at 30 or 40 miles an hour into Texas and Oklahoma. It picked up tons and tons of dirt as it swept along like a tidal wave.

After the crop failure in 1934, Plagge had to sell most of the cattle that he had accumulated since arriving in Baca County 5 years earlier. Cattle were cheap and scrawny from scarcity of feed, but the Government came to the rescue and bought most of them.

In the spring of 1935, Plagge had only eight cows. Four of them died from cockle-burr poisoning. There

was no feed in the country; maddened by hunger, the cattle broke into a neighboring field for the few green shoots of cockle burrs. The morning Plagge found them dead was the nadir of his despair and prospects.

Diversification and Conservation

Things gradually got better for the Plagge family after that. They could not have become worse. He quit planting wheat altogether. The feed crop of 1935 did not make grain, but it made forage. Again Plagge began to increase his livestock herd to keep from being entirely dependent upon the inconsistencies of the plains climate and the gamble that goes with one-crop wheat farming.

Since then, he has depended chiefly on milk cows, hogs, chickens, and turkeys. In 1937, with a Government loan, he bought some white-faced beef cattle. He raises practically all of the feed for his livestock. The summer crops were good this year, but even a feed-crop failure this fall would not force him to sell the cattle, as he did in 1934, because he has stacked a 2-year supply of feed.

He got the idea of diversification and conservation when others were saying that the "drought can't last forever—we'll make a killing next year."

Another setback occurred in 1937 when "the grasshoppers came and ate everything green on the place, even pastures."

The Plagges live in a modest four-room house 4 miles southwest of Pritchett, Colo., on a farm rented from a man who lives at Bucklin, Kans. Mrs. Plagge and the two chil-

dren, Irene, 13 years old, and Walter, 10, help with the chores.

All the farm houses on the 15-mile road to the farm are deserted.

Plagge started farming in Baca County with 640 acres, 320 of it in pasture, but since 1937 he has increased the size of his farm and now operates 1,280 acres, rented on long-term leases from four owners. He cultivates only 500 acres; the rest of it is in pasture.

He has planted no wheat since 1934, but he expects to sow some this fall if the season is favorable.

"It simply doesn't pay to plant wheat in this county unless you have moisture in the ground at planting time," he believes.

Contouring, an Idea from the Europeans

Even though the land is owned by somebody else, Plagge has tried to conserve the soil and improve the farms. He has terraces on nearly all the cultivated fields because they hold the water on the land. He plants and cultivates all his crops on the contour. Boys from the Civilian Conservation Corps camps at Springfield, Colo., helped Plagge build the terraces. Soil-conservation specialists from the Department of Agriculture gave him pointers on planning his farming system so that he can make more money and conserve the land.

Plagge got his first ideas about contour farming, however, when he was with the Eighty-ninth Division in the Army of Occupation of the Ruhr in 1918.

"Back in Kansas we thought good farm land was level land and everybody farmed by the points of the compass in a square pattern," he says.

"When I saw those German and French farmers running their rows around the slopes, it gave me an idea that it might work in this country. Although the land is pretty flat here in Baca County, we still lose a lot of water when we got a heavy rain, and I think this terracing and contour farming are just as important here as on one of those steep hills of Germany."

The records he and Mrs. Plagge keep of all their farm business show that their fortunes have been steadily improving since 1935. Each year the invoice made on January 1 has shown their worth to be a little higher than it was the year before. He has had some help from the Federal Government, and he owes the Government some money borrowed in 1937 to get him started with a herd of beef cattle, but he has paid part of the loan back and expects to clear the rest of it up within a few years.

He now milks 8 Holstein cows and has about 40 head of beef cattle and he sells a few steers each winter. He keeps two brood sows on the farm and always has some fat hogs to sell and butcher for the family's meat supply. He raises about 300 chickens and 100 to 300 turkeys; they bring in some money, but he depends primarily upon the sale of cream for a steady income.

Democracy and Community Responsibility

Through all the worst years, the Plagges have remembered their responsibilities to their children and to the community. He is president of the local chapter of the Grange, a

member of the County Land Use Planning Committee, and chairman of the Farm Program Building Committee for his community. He takes an active part in the affairs of the Western Baca County Soil Conservation District and is a member of the American Legion. He and Mrs. Plagge are leaders of the Pritchett 4-H Clubs, among the outstanding clubs of the State.

Plagge puts it this way:

"We know we haven't got a ghost of a chance of ever getting rich, but we are trying to start our children off right. In fact, that is our biggest job and we don't want to fall down on it.

"An individual of any community should contribute something to the community—that is a part of our democracy.

"I could do without a radio, but I wouldn't be much of a citizen or of much help to the community, if I didn't know what was going on. I could get along without an automobile—we used to when I was a kid, but if I didn't have a car now, every time I wanted to have a plow point sharpened or to get a repair part for some of the machinery, I would have to get a ride into town from one of the neighbors."

Plagge owns no land in Baca County (a reason for coming was to buy a farm), but his roots are deep in his community. He does not expect to leave:

"Somebody's got to live here. We have a lot of friends here and we are very interested in the Grange and the 4-H Club work and our soil conservation district. It took me 11 years to learn how to farm in this county. If I move to a new country, I will have to learn new methods again."



Books

GOOD COUNTRY

By LEWIS T. NORDYKE

A MAN WHO had been on the Texas plains when the few settlers lived in dug-outs was back in east Texas, and the people there wanted to know about "that Panhandle place."

"It's good country," he told them. "It's good country."

The waves of migration to the West more than half a century ago were inspired by the never-ceasing search for good country. That search for homesteads in good country was the major factor in the development of our western plains regions. But our literature, except in a few cases, has failed to capture that important element.

The operator of a sweets shop between two big movie houses in Dallas wrote a book titled *Cowboy Lingo*. It was distributed under the imprint of a leading book maker, and it was a best seller. The book, which covered well the salt of cowboy language, was along the line of the vast majority of writings about the cow country. We have only to recall a few western titles—*Saga of Billy the Kid*, *Fighting Men of the West*, *Hot Iron*, *The Heraldry of the Range*—to realize the factors with which most writers have concerned themselves.

The six-gun, the saloon brawl, the boothill graveyards, dance hall girls, cattle rustlers, stampedes and other

things on the glamor, romantic, and danger side have dominated western literature, particularly that of Texas. And the real, down-to-earth novel with the good country soul has not been written. Perhaps it will be developed before long, for there is a growing tendency toward love of the dirt. After all, we may come to realize that hot lead and bad whiskey didn't establish peace, order, and growth on the plains, that saloon brawls and dance hall girls didn't establish the homes that dot the plains.

Writings about the Great Plains fall into several divisions. We have, of course, the Spanish background—Coronado and the other explorers and their influences; the westward migration, mainly about the Santa Fe trail, the colorful guides of the Kit Carson sort; cowboys and bad men, and trail driving; the Indians and Indian wars; and biographies and autobiographies of the old-timers.

These works are very valuable. Andy Adams, an old trail-driver himself, was one of the best early-day writers of cow country stories. His *Log of a Cowboy* is the classic trail-driving story. Charles Siringo was another. His *Riata and Spurs* and other stories are important western literature.

J. Evetts Haley's *Charles Goodnight, Cowman and Plainsman* is among the leading biographies of plainsmen. His story of the XIT

ranch, although slightly one-sided in favor of the owners of the big ranch (who employed Haley to write the book), is a thrilling story of the era of development, and, to a degree, the British influence in the development of the plains cow country.

But even in these fine examples of plains literature we find the ever-present cow and cowboy. That is true, too, even in the fine history of the plains Walter P. Webb wrote.

One of the latest among the excellent plains stories is *The Trampling Herd*, by Paul I. Wellman, of Kansas City. He covers well the cow era in the plains country and the terminus of the cattle trails—Kansas. An-

other recent novel—and, incidentally, one that comes close to the good country spirit, is *The Mother of the Smiths*, by Lorraine Carr, a Texas writer who moved to Taos and chronicled life in the valley.

The present trend seems to be toward the land. The dust menace and the battle against wind erosion seem to have kindled a deep-seated appreciation for the dirt. Probably the romantic cowboy will always ride and shoot through our western plains' literature—but he likely will have to share the good things of life with characters rooted in the soil just as he did when the settlers came looking for good country.

For your attention

SOME GOVERNMENT PUBLICATIONS ABOUT THE SOUTHERN GREAT PLAINS

By ELSIE MARCLEY

COUNTY AGRICULTURAL PLANNING REPORT FOR THE TEN COUNTY AREA IN THE NORTHWEST TEXAS PANHANDLE. Mimeographed report prepared by the Texas Extension Service and the Department of Agriculture. College Station, Texas. April 1938.

A summary of recommendations made by county planning committees in 10 counties of the Texas Panhandle—Lipscomb, Ochiltree, Hansford, Hutchinson, Moore, Sherman, Dallam, Hartley, Oldham, Deaf Smith.

COUNTY PROBLEM ANALYSIS OF THE SOUTHERN GREAT PLAINS REGION, KANS. C. R. Jaccard and Roger Stewart. Mimeographed report pre-

pared by the Kansas Extension Service and Bureau of Agricultural Economics. Manhattan, Kansas. 1937.

Analysis made by the county planning committees of problems of the Southern Great Plains counties of Kansas and suggestions for correcting them.

THE DUST BOWL: AGRICULTURAL PROBLEMS AND SOLUTIONS. United States Department of Agriculture Editorial Reference Series: No. 7. Mimeographed. Prepared by Office of Land Use Coordination. July 15, 1940.

"A factual description of the changes in agriculture and the de-

velopment of agricultural problems in the area now called the Dust Bowl, together with a description and evaluation of certain programs which work toward a solution of these problems."

DUST-BOWL EXPERIENCE WITH STRIP-CROPPING R. R. Hinde. Soil Conservation magazine. October 1938.

Tells results obtained from strip-cropping in the Southern Great Plains and how this practice may be used with different crops.

DUSTSTORMS IN THE SOUTHWESTERN PLAINS AREA. H. F. Choun. United States Monthly Weather Review. June 1936.

Verifies the severity of soil erosion due to wind and suggests selective tilling of some of the area with use of the remainder for grazing purposes; gives tabular data on dust-storms at Amarillo, Tex., during 1933, 1934, 1935, and 1936.

ECONOMIC UNITS FOR THE DUST BOWL. W. R. Watson. Soil conservation magazine. September 1938.

An explanation of the unit-reorganization program in the Southern Great Plains, which enables farmers to operate units of sufficient size to have diversified farming that will make them self-sufficient.

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Risky

The Great Plains can be made a dependable source of a large portion of our essential food supply. Investments in their development can be rescued from uncertainty and under proper conditions new investments can be made securely. The plains can be transformed from a risky adventure and a recurrent liability into a stable basis of economic and social profit to their inhabitants and to the whole country.

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